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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,781	02/18/2004	Ji-Yong Park	6161.0111.US	1632

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EXAMINER

LANDAU, MATTHEW C

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

8m

Office Action Summary

Application No.

10/779,781

Applicant(s)

PARK ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 2,5-7,9-12 and 14-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3,8 and 13 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/1/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

During a telephone conversation with Hae-Chan Park (Reg. #50,114) on June 21, 2005 a provisional election was made without traverse to prosecute the invention of Group I, Species 1, claims 1, 3, 4, 8, and 13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 2, 5-7, 9-12, and 14-46 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention/species.

The restriction/election of species requirement is provided below:

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-26, drawn to a display device, classified in class 257, subclass 72.
- II. Claims 27-36, drawn to a CMOS transistor, classified in class 257, subclass 66.
- III. Claims 37-46, drawn to a display device, classified in class 349, subclass 1+.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination of claim 1 does not require N and P type transistors as required by the subcombination of claim 27. The subcombination has separate utility such as use in a memory array.

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Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination of claim 1 does not require green, red, and blue pixel regions as required by the subcombination of claim 37. The subcombination has separate utility such as use in a display device wherein the switching transistors have the approximately the same number of grain boundaries (or more) in the channel than the driving transistors.

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as in a memory device. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, the search required for Group II is not required for Groups I or III, the search required for Group III is not required for Groups I or II, and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

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Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Furthermore, this application contains claims directed to the following patentably distinct species of the claimed invention:

- a. Species I, as shown in Figure 4.
- b. Species II, as shown in Figure 5.
- c. Species III, as shown in Figure 6.
- d. Species IV, as shown in Figure 7.
- e. Species V, as shown in Figure 11.
- f. Species VI, as shown in Figure 12.
- g. Species VII, as shown in Figure 13.
- h. Species VIII, as shown in Figure 14.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable

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thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Drawings

Figures 1-3C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 1 and 4 are objected to because of the following informalities:

Regarding claim 1, the limitation “divided into gate lines...” is objected to. It is suggested this limitation be changed to “divided by ~~into~~ gate lines...”.

Regarding claim 4, it is noted that in order for claim 1 to read on the elected species shown in Figure 4, the “grain boundaries” referred to in the claim must be the side grain boundaries shown in Figure 4. However, claim 4 recites “the polycrystalline silicon grain boundaries” and states that they are inclined to an angle of –45 to 45 degrees. As shown in Figure 4, only the primary grain boundaries are inclined to that angle. Therefore, it is suggested the limitation be changed to read “the primary polycrystalline silicon grain boundaries”.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 8, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyanaga et al. (US Pat. 5,705,829, hereinafter Miyanaga).

Regarding claims 1 and 13, Figure 1 of Miyanaga discloses a flat panel display device (liquid crystal display) comprising: a pixel portion divided by gate lines and data lines and equipped with a thin film transistor (TFT) (Figure 5F) driven by signals applied by the gate lines

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and data lines; and a driving circuit portion comprising one or more TFTs (Figure 5F) connected to the gate lines and data lines respectively to apply signals to the pixel portion, wherein the average number of grain boundaries of polycrystalline silicon which are formed in active channel regions of the one or more thin film transistors installed at the driving circuit portion and meet a current direction line is at least one or more less than the average number of grain boundaries of polycrystalline silicon which are formed in active channel regions of the TFT installed at the pixel portion and meet a current direction line for a unit area of active channels. Note that Miyanaaga discloses the grain boundaries in the channel of the driving (peripheral) TFT extend parallel to the current direction and that the grain boundaries in the channel of the pixel (switching) TFT extend perpendicular to the current direction (col. 2, lines 30-50 and col. 8, lines 42-51). Therefore, it is inherent that the number of grain boundaries the meet (i.e., intersect) the current direction in the driving TFTs is less than that of the pixel TFTs. Miyanaaga also discloses that that peripheral region (driving TFT region) is irradiated with laser light to improve crystallinity (col. 7, lines 11-15). By performing this irradiation, the grain size with increase, thereby reducing the number of grain boundaries in the channel. This disclosure further supports the above statement of inherency.

Regarding claim 3, it is inherent that the when the crystallization process of Miyanaaga is used, the grains are anisotropic and the above mentioned grain boundaries are side grain boundaries.

Regarding claim 8, Miyanaaga discloses the polycrystalline silicon is fabricated by a metal induced lateral crystallization method (col. 6, line 53-col. 7, line 10).

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Allowable Subject Matter

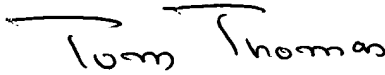
Claim 4 would be allowable if rewritten to overcome the claim objections set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TOM THOMAS
SUPERVISORY PATENT EXAMINER

Matthew C. Landau

Examiner

June 22, 2005